ABSTRACT

Disclosed is a frequency converter with an excellent frequency characteristic, having a minimized number of multipliers. A digital down-converter includes a decimator/mixer, an interpolator and a channel filter. The decimator/mixer performs quadrature conversion from a real signal to complex signals, frequency conversion by a frequency $K\omega$, and $1/(M\times I)$-fold decimation on a signal obtained by sampling an RF/IF signal S(i) by an A/D converter. The interpolator is comprised of I-fold up-samplers and lowpass filters, and performs I-fold interpolation on the outputs from the decimator/mixer. The channel filter is comprised of lowpass filters having a band characteristic given to a communication channel, and outputs band-rejected baseband signals i(j) and q(j) by filtering the outputs of the interpolator.